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ABSTRACT

The performances of three groups of neonates on the Brazelton Neonatal Behavioral Assessment Scale were compared to determine if cultural differences exist. Subjects were 90 full term, healthy infants; 30 born in Puerto Rico, 30 black and 30 white born in Florida who were administered the scale within the first two days of life. Eight summary variables based on the four a priori dimensions of interactive processes, motoric processes, state organization, and physiological organization were selected. For each summary variable a mean score was calculated after having recoded the items comprising each cluster on the same direction. The three groups of neonates were compared by computing a one way analysis of variance for each variable. Results showed main effects for six of the summary variables indicating the existence of cultural differences between Puerto Rican and black and white North American newborns. Puerto Rican babies had better orienting and following, were easier to console, and more capable of controlling their physiological response to stress. Results are discussed in terms of cultural expectations, mother/infant interaction, and infant adaptation to environment.
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DIFFERENCES IN BRAZELTON SCALE PERFORMANCE BETWEEN
PUERTO RICAN AND NORTH AMERICAN
WHITE AND BLACK NEWBORNS

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DIFFERENCES IN BRAZELTON SCALE PERFORMANCE BETWEEN PUERTO RICAN
AND NORTH AMERICAN WHITE AND BLACK NEWBORNS

CYNTHIA GARCIA COLL, CAROL SEPKOSKI AND BARRY M. LESTER

Cross-cultural studies allow us to ask whether our generalizations about human behavior are valid only in one culture or if they appear to hold universally. This approach enable us to enlarge our perspective and understanding of what is "normal" by exposing us to differences and commonalities in development. Cross-cultural differences in newborn behavior have been reported in several studies using the Brazelton Neonatal Behavioral Assessment Scale.

Freedman and Freedman (1969) found temperamental differences between Chinese-American and European American newborns. The caucasian infants showed greater lability of state, while the oriental infants were more calm and passive in response to some of the aversive stimuli. The oriental infants also displayed a faster response decrement to the repeated presentation of flashes of light and a much more rapid response to the examiner's attempts to soothe them.

Brazelton, Roley and Collier (1969) compared the performance of a group of Zinacanteco Indian newborns of Mexico to a sample of White United State infants. When compared to the caucasian newborns, the Zinacanteco Indians showed greater motor maturity, smoother transitions from one state to another and were better able to maintain quiet, alert states for longer periods of time.

Finally, Brazelton, Kolowsky and Tronick (1976) found differences in the recovery pattern and scale performance across the first ten days of life between American and Zambian neonates. While the American newborns stayed within an average range on days one, five and ten, the Zambians scored higher by day ten on items relating to social

attentiveness.

We compared performance on the Brazelton Scale between a group of Puerto Rican neonates and groups of White and Black North American newborns. We wanted to use the American groups as a backdrop to capture the uniqueness of the behavioral repertoire of the Puerto Rican infants. We also wanted to try to paint a behavioral profile of the Puerto Rican infants by looking at the relative contribution of behavioral clusters to discriminate between Puerto Rican and White and Black North American infants.

Method

The sample consisted of 30 infants born at the Hospital Municipal de San Juan, Puerto Rico and 30 Black and 30 White infants born at Shands Teaching Hospital at the University of Florida. All infants were full term, appropriate for gestational age, healthy infants born of medically uneventful pregnancies and deliveries. The scale was administered within the first two days of life by two examiners trained in the use of the scale.

Results

In order to compare the Brazelton Scale performance between Puerto Rican and White and Black North Americans, we extracted eight summary variables to reduce the overall number of statistical tests. These variables are based on the four a priori dimensions of interactive processes, motoric processes, state organization and physiological organization, but were modified in accordance with our clinical impression of the behavioral uniqueness of the Puerto Rican infants. In other words, we selected those items that we felt best characterized the performance of these infants.

For each summary variable, we calculated a mean score, after having recoded the items comprising each cluster on the same direction. We compared the three groups by computing a one way analysis of variance for each variable. This analysis of variance showed significant main effects for six of the summary variables.

Insert table 1 here

Table one shows the comparisons between the Black and Puerto Rican infants for the summary variables. On the first cluster, which includes the six Orientation items plus Alertness, the Puerto Rican shows better performance than the Black North American sample. The Black babies scored higher on the second cluster, composed of the Motor Maturity, Pull-to-Sit and Muscle Tone items. Cluster 3, which includes Defense Movements and Hand-to-Mouth, shows no differences. On the fourth summary variable, defined by the four response decrement or habituation items, Black infants habituated more rapidly than the Puerto Rican newborns. The fifth cluster is composed of the items of Lability of State, Irritability, Peak of Excitement, Rapidity of Build-Up and Self-Quieting. Here, the Puerto Rican infants showed better state organization than the Black infants. Variable 6 shows less startles among Puerto Rican than Black infants. Cuddliness, the next variable, showed no group differences. The last variable, Consolability with Intervention, was treated differently. Here we looked at the number of times that consolability was not administered. This reflects infants who showed no sustained crying episodes or were successfully at Self-Quieting. A test of proportions showed that

the number of not-administered scores was greater on the Puerto Rican group than in the Black sample.

Insert table 2 here

Table 2 shows the comparisons between the Puerto Rican and White infants. The Puerto Rican infants showed better Orientation and Alertness scores, Defensive Movements and Hand-to-Mouth facility better State Control and fewer Startles. The White infants scored higher on the Motor items, cluster 2, and habituated more rapidly than the Puerto Rican infants. White babies also required more consolability with intervention than the Puerto Rican babies.

We also wanted to look at the predictive ability of the combination of the summary variables to discriminate Puerto Rican from White and Black North American infants and to determine the relative contribution of each discriminating variable. With this on mind, two discriminant analysis were performed to compare Puerto Ricans and Blacks and Puerto Rican and White infants.

Insert table 3 here

This table shows a summary of the stepwise discriminant analysis in which the summary variables were used to discriminate Puerto Rican from Black babies. The order of entry of the predictors was determined by the amount of variance explained by each variable.

The linear combination of five variables best discriminated Puerto Rican from Black infants. Cluster 4, the Response Decrement Items, was the single best predictor. This cluster also showed the

highest relative contribution to the discriminant function as indicated by the standardized discriminant function coefficient. This cluster was followed by the Orientation and Alertness cluster, the number of Startles, State Control and Motor Items.

Insert table 4 here

This table shows the prediction results of the discriminant function. The analysis compares the actual group membership of the infant with the predicted group membership as classified by the discriminant function. 93.3% of the Puerto Rican infants and 86.7% of the Black infants was correctly classified. This represents an overall hit rate of 90%. This also showed a significant chi-square distribution and a canonical correlation of .81, indicating that 64% of the variance of the discriminant function was explained by the groups.

Insert table 5 here

This table shows the summary of stepwise discriminant analysis for White and Puerto Rican newborns. The combination of four summary variables best discriminated White from Puerto Rican neonates. The single best predictor was the same cluster as for Puerto Ricans and Blacks (cluster 4) comprising the Response Decrement items. It was followed by cluster 3, Defense Movements and Hand-to-mouth; cluster 2, Motor items and the number of startles.

Insert table 6 here

This table shows the prediction results of the discriminant function for White and Puerto Rican babies. A total of 96% of the Puerto Rican infants and 93.3% of the White babies were correctly classified, representing an overall correct classification of 95%. This also yields a significant chi-square distribution and a canonical correlation of .87 indicating that 77% of the variance of the discriminant function is accounted for by the groups.

Discussion

The results of this study indicate the existence of cultural differences between Puerto Rican and Black and White North American newborns, along several summary variables of the Brazelton Scale. Puerto Rican babies had better orienting and following, were easier to console, and more capable of controlling their physiological responses to stress (less startles). It was our general impression that these babies came rapidly into alert state and that their prolonged period of alertness was accompanied by a high responsivity to stimulation and physical activity. Puerto Rican babies maintained a lower level of arousal, taking longer to reach their peak of excitement. When they did cry, they frequently self quieted by inserting their hands in their mouth, or if necessary, responded readily to the examiner's attempts to soothe them. Another striking difference between this sample of Puerto Rican infants and the White and Black North American infants was on the Habituation items. The Puerto Rican babies kept responding to the repeated presentation of the visual, auditory and tactile stimuli sometimes up to 15 trials.

These cross-cultural differences were highlighted by the results of the discriminant analysis. By looking at the linear combination

of behavioral clusters, we were able to correctly classified over 90% of the infants into their cultural group. This approach to the study of cross-cultural differences is useful as it enables us to avoid extracting a serie of significant but possibly redundant individual effects as in an item by item comparison.. It also enables us to capture constelations of behavior that discriminate among the groups.

An additional way of looking at the Brazelton Scale is to treat the number of not-administered or no-response items, as reflecting the individuality of the infant's behavior. This was illustrated by the use of a test of proportions on the Consolability with Intervention item in this study. For example, an infant who reaches a high state of arousal at the beggining of the test will score not-administered on the Habituation items, possibly reflecting a temperamentally labile infant. By examining the frequency of these scores, the proportion of not-administered or no-response scores contribute to the behavioral description of the infant and is not treated as missing data.

How can we account for these cultural differences in newborn behavior? We may suggest that the infants behavior is a result of an interaction between inherited factors, prenatal influences and perinatal experiences. We view the infant's behavior as the product of the organism's process of adapting to its environment and developing in response to the demands placed upon him. This interactive process starts in utero where the fetus is receiving constant input from its surroundings, which can already reflect variations from one culture to another. For example, nutritional intake and prenatal activity of the mother can possibly affect the developing organism. Then, during

and after birth and the recovery from the stress from birth, behavior is rapidly affected by factors other than inheritance, even from the first hours of life (Brazelton et al, 1972). Adult's handling and interactions with the newborn will vary according to the social expectations and child rearing practices of that particular culture and will interact with the infant's behavioral organization. Our conceptualization of culture, thus, reflect the interplay of the genetic endowment and prenatal and postnatal environmental input. The results of this study imply that when referring to "normal" behavior, it may be more meaningful to talk about what is the typical behavior of a White, Black or Puerto Rican newborn and to view deviancy in its appropriate cultural context.

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TABLE 1
MEANS AND STANDARD DEVIATIONS ON THE BRAZELTON SCALE FOR BLACK
AND PUERTO RICAN NEWBORNS

ITEMS	<u>BLACK</u>		<u>PUERTO RICAN</u>		
	MEAN	SD	MEAN	SD	
1) ORIENTATION ITEMS ALERTNESS	5.8	1.4	7.1	.9	3.9***
2) MOTOR MATURITY PULL-TO-SIT MUSCLE TONE	5.2	.9	4.4	.6	3.7***
3) DEFENSIVE MOVEMENTS HAND TO MOUTH FACILITY	6.3	1.2	6.8	1.0	ns
4) RESPONSE DECREMENT ITEMS	6.1	1.1	3.9	.7	8.5***
5) STATE CONTROL ITEMS	5.7	.8	4.4	1.3	4.8***
6) STARTLES	4.6	2.0	2.7	1.5	3.8***
7) CUDDLINESS	5.2	1.8	4.9	.8	ns
8) CONSOLABILITY WITH INTERVENTION (PROPORTION OF NA'S)		.16		.57	3.4*

* SIGNIFICANT AT .05
** SIGNIFICANT AT .01
*** SIGNIFICANT AT .001

TABLE 2
MEANS AND STANDARD DEVIATIONS ON THE BRAZELTON SCORES FOR WHITE
AND PUERTO RICAN NEWBORNS

ITEMS	<u>WHITE</u>		<u>PUERTO RICAN</u>		t
	MEAN	SD	MEAN	SD	
1) ORIENTATION ITEMS ALERTNESS	6.2	1.3	7.1	.9	2.6*
2) MOTOR MATURITY PULL-TO-SIT MUSCLE TONE	5.1	.8	4.4	.6	3.0***
3) DEFENSIVE MOVEMENTS HAND TO MOUTH FACILITY	5.2	1.4	6.8	1.0	5.0***
4) RESPONSE DECREMENT ITEMS	6.3	.9	3.9	.7	9.5***
5) STATE CONTROL ITEMS	5.6	.9	4.4	1.3	4.5***
6) STARTLES	5.2	2.1	2.7	1.5	4.9***
7) CUDDLINESS	5.8	1.5	4.9	.8	ns
8) CONSOLABILITY WITH INTERVENTION (PROPORTION OF NA'S)		.17		.57	3.3*

* SIGNIFICANT AT .05

** SIGNIFICANT AT .01

*** SIGNIFICANT AT .001

TABLE 3
SUMMARY OF STEPWISE DISCRIMINANT ANALYSIS FOR BLACK AND
PUERTO RICAN NEWBORNS

STEP NUMBER	VARIABLE	SIGNIFICANCE LEVEL	STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS
1	CLUSTER 4	.001	-.62
2	CLUSTER 1	.001	.19
3	STARTLES	.001	-.21
4	CLUSTER 5	.001	-.21
5	CLUSTER 2	.001	-.13

TABLE 4
PREDICTION RESULTS OF DISCRIMINANT FUNCTION FOR BLACK AND
PUERTO RICAN NEWBORNS

ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP	
		GROUP 1	GROUP 2
(1) BLACK	30	86.7%	13.3%
(2) PUERTO RICAN	30	6.7%	93.3%

PERCENT OF "GROUPED" CASES CORRECTLY CLASSIFIED: 90%

CANONICAL CORRELATION: .815

CHI-SQUARE: 60.5

SIGNIFICANCE: .001

TABLE 5

SUMMARY OF STEPWISE DISCRIMINANT ANALYSIS FOR WHITE AND
PUERTO RICAN NEWBORNS

STEP NUMBER	VARIABLE	SIGNIFICANCE LEVEL	STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS
1	CLUSTER 4	.001	-.62
2	CLUSTER 3	.001	.38
3	CLUSTER 2	.001	-.23
4	STARTLES	.001	-.12

TABLE 6

PREDICTION RESULTS OF DISCRIMINANT FUNCTION FOR WHITE AND
PUERTO RICAN NEWBORNS

ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP	
		GROUP 1	GROUP 2
(1) WHITE	30	93.3%	6.7%
(2) PUERTO RICAN	30	3.3%	96.7%

PERCENT OF "GROUPED" CASES CORRECTLY CLASSIFIED: 95%

CANONICAL CORRELATION: .878

CHI-SQUARE: 82.4 SIGNIFICANCE: .001